

## ABSTRACT

5 A unique imaging sensor consists of a two-dimensional array of impedance electrode elements separated from chemical or biological samples contained in or containing fluids by a fluid-impervious layer which prevents electrode fouling. It can serve for various chemical and biological sensing applications, ranging from diagnosing cancer to monitoring metabolic changes in real time or the progress of cryosurgery. The imaging can be applied to single cells in a manner that allows only specific cell lines to attach [using selective derivatization of the layer surface], then monitors their viability, type, and status with impedance, and further measures their size and shape by use the two-dimensionality of the electrodes array.